EMERGENCY SUPPORT FUNCTION (ESF) 2
TELECOMMUNICATIONS AND WARNING

PRIMARY AGENCIES: Local Government and Private Information & Telecommunications Service (ITS) Departments
King County Radio Communications Services Section (800 MHz Radio)
Eastside Public Safety Communications Agency (EPSCA)
(800 MHz Radio)
City of Seattle (800 MHz Radio)
Local Emergency Management Organizations
Public Safety Answering Points (PSAPs)
Private Telecommunications Service Providers

SUPPORT AGENCIES: King County Department of Natural Resources and Parks
King County E911Program Office
National Weather Service - Seattle
King County Hospitals
Amateur Radio Organizations

I. INTRODUCTION

A. Purpose

The purpose of this Emergency Support Function (ESF) is to facilitate a regional approach to prioritizing, reestablishing and maintaining voice and data communications capabilities throughout King County.

It also defines responsibilities and mechanisms involved with alerting key officials and warning the general public of potential or occurring emergencies.

B. Scope

This ESF encompasses all local government agencies, special purpose districts, and private industries in the King County region that are signatories to the Regional Disaster Plan for Public and Private Organizations in King County, Washington. It addresses responsibilities and priorities for all forms of voice and data communications systems used by these agencies during emergencies. Specific protocols regarding emergency communications are addressed in Appendix 1: Communications Protocols, of this ESF and

in standard operating procedures and checklists of participating jurisdictions.

This ESF also defines the parties involved and their responsibilities for disseminating regional warnings throughout King County. Regional public information roles and responsibilities will be addressed in the Regional Disaster Plan Appendix 2 - Public Information.

II. POLICIES

Participants of the Regional Disaster Plan will assist in the coordination of emergency communications during disasters that affect the King County region. Incorporated jurisdictions will perform emergency management functions within their jurisdictional boundaries as mandated by RCW 38.52.070. A collaborative response by public, private and nonprofit organizations will greatly benefit and facilitate emergency communications throughout the King County.

Following a disaster, emergency communications and warning systems within the King County region will be reestablished based on the following priorities:

- public warning, support of evacuations, and rescuing victims
- reestablishing critical infrastructure and government functions
- support for field response actions that address the basic human needs of victims
- protection of public property, the economy and the environment

III. SITUATION

A. Emergency/Disaster Conditions and Hazards

Natural and technological disasters may significantly impact communications infrastructure in King County. Communications services of all types may be limited or interrupted due to structural damages, equipment failures, or excessive demand. Loss of standard communications systems may necessitate the need to reprioritize existing systems to support the most critical operational needs of the region.

Disaster warnings may be issued by emergency response agencies in King County for any hazard posing a threat to public safety. However, no single warning system can guarantee contact with all vulnerable residents for every hazard. Therefore, jurisdictions throughout King County must jointly participate in a comprehensive warning system

including multiple methods of receiving and disseminating warning messages.

B. Planning Assumptions

Communications systems are vulnerable and may be damaged, destroyed, or overwhelmed during and following an emergency or disaster. Due to disrupted transportation routes, weather conditions, a lack of resources, or the level of damage, repairs to communications equipment and infrastructure could take days, weeks or months.

No single warning system exists in King County that will alert all citizens of every threatening disaster or emergency situation. There may be occasions when there is no time or mechanism to provide warning.

The Emergency Alert System (EAS) transmits immediate life safety warnings initiated by federal, state or local authorities, relying on radio and television broadcasters, and the National Weather Service to relay messages to King County citizens. Broadcasters are not required to relay state or local warning messages, yet are required to relay presidential messages initiated by the National Warning Center. Once the initial warning is accomplished, public information officers within local EOCs will keep the public informed of what actions to take to prevent further injury or property loss. (Note: Appendix 2, Public Information, of the Regional Disaster Plan identifies the parties involved with coordinating regional public information and their responsibilities).

The National Weather Service - Seattle is the primary originator of weather related warnings for all jurisdictions in King County.

The Flood Warning Center, operated by the King County Department of Natural Resources and Parks, Water and Land Resources Division, provides technical assistance to local jurisdictions regarding flood conditions and directly warns vulnerable jurisdictions and residents when flood conditions occur.

As participants of the Regional Disaster Plan, local emergency management agencies, PSAPs, and private industries will monitor hazardous conditions that may impact their jurisdictions or facilities, and maintain equipment for receiving warnings for all potential hazards.

Amateur radio resources may be utilized to augment primary communications systems such as hard line telephones and 800 MHz radio in EOCs and other critical facilities.

IV. CONCEPT OF OPERATIONS

A. General

Reliable communications capabilities are necessary for day to day government operations, warning the public of impending events, management of response and recovery efforts, search and rescue missions, and coordination with other organizations. Communications systems in Emergency Operations Centers (EOC), alternate EOCs, PSAPs, warning originators, and field units must incorporate the highest levels of redundancy to ensure functionality following any potential hazard.

Warning messages may be transmitted by the State Warning Point (SWP) or other state agencies, federal agencies, PSAPs, local EOCs, and on-scene incident commanders, depending on the specific hazard, statutory responsibilities and the threatened population. Methods of transmitting warning messages to key officials and the public and receiving messages from originators include EAS, National Weather Service All Hazard Radio, EMWIN, Emergency Email Network, media broadcasts, telephone, dedicated government communications systems, pager or radio notification, public address announcements, person-to-person contacts, and internet transmissions.

The State Warning Point (SWP) disseminates national warnings and additional state warnings via the National Warning System (NAWAS) to local Primary Warning Points (statewide fanout). The King County Sheriff’s Office (KCSO) Communications Center is the "Primary Warning Point" for the King County region. The King County and Seattle EOCs serve as alternate"Primary Warning Points." The following PSAPs in King County are "Secondary Warning Points":

- Eastside Communications Center
- Port of Seattle Police Department
- Bothell Police Department
- Redmond Police Department
- Enumclaw Police Department
- Seattle Police Department
- Issaquah Police Department
- King County Fire District #13 (Vashon Island)
- Kirkland Police Department

- Mercer Island Department of Public Safety
- Valley Communications Center

Upon receiving a national or state warning message from the State Warning Point (SWP), the King County Primary Warning Point will continue the statewide fan-out to all secondary warning points in the county. Secondary Warning Points will follow local procedures regarding notification of local emergency management and response agencies (see this ESF's attached Appendix 2: Statewide Warning Fan-out).

Procedures addressing the protocols for operating regional warning systems in King County include:

- Local Emergency Management Agencies' Communications SOPs
- National Warning System Operations Handbook
- Central Puget Sound Region EAS Plan

B. Organization

During day-to-day operations, local governments, districts, agencies, and organizations develop, coordinate and maintain their own internal voice and data communications systems. Landline telephone service (dial tone) throughout King County is provided by various private industries including Qwest and Verizon. All jurisdictions, districts and private industries coordinate independently with private service providers to manage telephony services in King County.

The county-wide 800 MHz radio system is maintained as three subsystems using common controller equipment. The subsystems are maintained by King County ITS Division, the City of Seattle, and EPSCA (Bellevue, Kirkland, Mercer Island, Issaquah, Redmond and Woodinville). The City of Seattle maintains the common controller equipment. The microwave components of the system are maintained by the City of Seattle (components in the northern part of the county) and King County ITS Division (components in the southern part of the county).

The King County ITS Division maintains several Very High Frequency (VHF) and Ultra High Frequency (UHF) repeater systems for public safety use throughout the county. During regional disasters, these systems can augment the regional 800 MHz system as a multi-jurisdictional communications tool.

King County government owns, operates and maintains the I-NET (Institutional Network), a fiber optic network providing voice, data, and

video connections to approximately 280 county, city and district sites throughout King County.

Miscellaneous common carriers located throughout the county provide mobile dispatch service, paging service, and cellular telephone service.

C. Procedures

Jurisdictions and private industries participating in the Regional Disaster Plan maintain specific standard operating procedures regarding emergency communications for their organizations.

All participants in the Plan will implement the protocols included in Appendix 1: Communications Protocols of this ESF for inter-jurisdictional communications. These protocols define primary and secondary communications systems for both voice and data, and differentiate between systems utilized and monitored during normal and emergency operations.

D. Mitigation

All mitigation activities are detailed in jurisdictional and regional mitigation plans and procedures, and appropriate state and federal mitigation guidelines.

E. Response / Recovery Activities

All response and recovery activities are detailed in jurisdictional plans and procedures, and appropriate state and federal recovery guidelines.

V. RESPONSIBILITIES

A. Primary Agencies

1. Local Government ITS Departments, EPSCA, City of Seattle
The King County Department of Executive Services ITS Division, EPSCA and the City of Seattle are responsible for coordinating the maintenance and continued operations of the 800 MHz radio system. During disasters, the first priority for regional communications system restoration will be the 800 MHz radio system for emergency response agencies. Each managing jurisdiction is responsible for maintaining the integrity of their subsystem by managing the priorities of users. The

King County ITS Division will maintain, operate and restore, as necessary, county-owned VHF and UHF repeater systems to augment the 800 MHz system in support of regional public safety communications during disasters.

All jurisdictions and districts will coordinate independently or by zone with private industry telephone service and equipment providers to ensure telephone, cellular and internet service for government functions are maintained and restored as soon as possible. If done by zone, representatives from private telephone service providers will be represented in "Zone Coordination Centers" during disasters. Information regarding restoration times, extent of outages, and needed resources will be communicated from the "Zone Coordination Centers" to all jurisdictions throughout the zone. Local governments will prioritize critical telecommunications systems based on the criteria stated in "Section II. Policies" of this ESF. Regional Disaster Plan parties will focus their resources on restoring internal communications systems first, then reestablishing communications with other jurisdictions in the county, and finally providing resource assistance, when possible, to other impacted parties.

King County ITS Division will operate, maintain and restore, as necessary, the I-NET and Wide Area Network systems. All jurisdictions and private industries are responsible for the maintenance and operation of departmental Local Area Networks.

2. Local Emergency Management Organizations

Local emergency management organizations will coordinate the notification and mobilization of amateur radio personnel to support emergency operations within their jurisdictions. Each zone will coordinate mutual aid requests for amateur radio resources within their zone, consistent with the concept of operations of the Regional Disaster Plan. The King County EOC will coordinate mutual aid assistance of amateur radio resources in support of all emergency management zones. (See Appendix 1: Communications Protocols.) Requests for amateur radio resources from the State EOC will be coordinated consistent with the State Radio Amateur Civil Emergency Services (RACES) Plan.

King County OEM will develop and maintain operational procedures for activating and testing the EAS. The Local Area Emergency Communications Committee (LAECC) is comprised

of representatives from King County, Seattle, Bellevue, Pierce County, Kitsap County, Snohomish County, Jefferson County, and Island County. In conjunction with private broadcasters, the LAECC will coordinate with EAS warning centers within King County, as well as federal, state and local agencies and members of the media regarding improvements to EAS activation procedures.

Local offices of emergency management will coordinate with federal and state agencies regarding the appropriate use of federal and state communications systems on a daily basis and during emergencies and disasters. Local SOPs regarding the use of these systems will be consistent with state and federal SOPs.

3. Public Safety Answering Points (PSAP)

The KCSO Communications Center serves as the Primary Warning Point in King County for the National Warning System, as stated in the National Warning System Operations Handbook. Responsibilities of the primary warning point include receiving warnings from local, state and federal sources regarding all potential hazards and relaying warnings, when necessary, to all Secondary Warning Points (as listed in the National Warning System Operations Handbook) in King County. Each PSAP is responsible for communicating warnings and notifications to local agencies and EOCs consistent with established local procedures.

The KCSO Communications Center also serves as the primary originator of EAS warning messages throughout King County as referenced in the Central Puget Sound Regional EAS Plan. Alternate originators of EAS messages include Eastside Communications Center, King County EOC, and the Seattle Division of Emergency Management. PSAPs serve as a critical link between local incident commanders and the EAS. Incident commanders requesting EAS activation in support of local protective actions will coordinate with their appropriate PSAP who will connect them directly with the KCSO Communications Center.

4. Private Telecommunications Service Providers

Private telecommunications service providers maintain responsibility for operating and restoring privately owned communications infrastructure and equipment in King County. All jurisdictions and private industries will coordinate with private

service providers to ensure operability of critical telecommunications systems.

Service interruptions to telecommunications systems in King County will be addressed by private telecommunications providers consistent with the provisions stated in Washington Administrative Code 480-120-520. Under all conditions, agencies and facilities responsible for restoring and maintaining public health and safety shall be given top priority for telecommunications service restoration. Secondary priorities for restoration of service during disasters will be established by representatives of the "Utilities & Transportation Commission" at the State EOC.

B. Support Agencies

1. King County Department of Natural Resources and Parks

The King County Department of Natural Resources and Parks will maintain a county-wide warning system through the Flood Warning Center for county departments, cities, special purpose districts, and citizens who reside along river basins.

2. King County Department of Executive Services, E911 Program Office

The King County E911 Program Office is responsible for administering the regional 911 telephone system covering the entire county. The Office also maintains the dedicated computer data network between all PSAPs in the county.

3. National Weather Service - Seattle

The National Weather Service - Seattle (NWS-Seattle) office is responsible for disseminating all weather related warnings, advisories and statements for 14 counties in western Washington, including King County. NWS - Seattle will disseminate weather information and warnings through several means including dedicated weather systems (EMWIN, Weather Wire, NOAA All-Hazard Radios), national warning systems (NAWAS, Emergency Email Network), and the internet. The Washington State Patrol relays all NWS - Seattle weather statements for King County to all ACCESS terminals in the county.

Pursuant to a written agreement between the NWS – Seattle office and the Washington Emergency Management Division, the NWS office will relay civil emergency warnings developed and authorized by state or local emergency management

agencies. These warning messages will be transmitted via NOAA Weather Radio and the NOAA Weather Wire Service throughout designated Washington counties.

The NWS - Seattle office also maintains multiple communications systems including NAWAS, 800 MHz radio, Amateur Radio, and unpublished telephone numbers for use only by emergency response agencies.

4. Hospitals

Harborview Medical Center serves as net control for 800 MHz and amateur radio communications among all hospitals in King County. Harborview also coordinates data communications and internet updates regarding the status of all hospitals in the county.

5. Amateur Radio Organizations

As part of their emergency management plan, each local jurisdiction in King County is responsible for coordinating amateur radio resources for emergency communications support. For multi-jurisdictional events necessitating activation of the Regional Disaster Plan and mobilization of mutual aid, each zone will coordinate mutual aid requests for amateur radio resources within their zone. The King County EOC will coordinate identification and mobilization of amateur radio operators to support all zones.

When tasked through the King County EOC during regional disasters, the King County Search and Rescue Association (KCSARA) and Amateur Radio Emergency Services (ARES) will identify and mobilize, among their members, available amateur radio operators. These operators will be notified and deployed by KCSARA and ARES to fulfill resource requests received from impacted zones.

VI. REFERENCES

- Local Emergency Management Plans within King County
- Washington State Comprehensive Emergency Management Plan
- Central Puget Sound Region EAS Plan
- National Warning System Operations Handbook
- Regional Disaster Plan, Appendix 2: Public Information
- Washington State RACES Plan
- WAC 480-120-520, Major Telecommunications Outages and Interruptions
- NWS Agreement for Transmission of Warning Messages, April 1981

EMERGENCY SUPPORT FUNCTION (ESF) 2
TELECOMMUNICATIONS AND WARNING

APPENDIX 1 – Communications Protocols

Introduction

Communications systems used by emergency managers must be reliable, redundant, and effective in accomplishing their intended purpose. Participants in the Regional Disaster Plan utilize various communications systems to send and receive voice and digital data on a daily basis and during emergencies. These protocols identify the various systems used by regional partners in King County for communication of voice and digital information, the circumstances under which each system is used, and an appendix of technical communications information.

Purpose

This document identifies and prioritizes the various systems used by regional partners to communicate emergency information. It establishes certainty and consistency among emergency management partners in King County regarding specific contact information and the circumstances for using given communications systems.

Scope

These protocols address systems used daily and during emergencies by all participants of the Regional Disaster Plan to send and receive data and voice communications. Systems include commercial, governmental, and amateur; data and voice; terrestrial and satellite based; hard wired and radio; publicly disseminated and restricted to emergency management agencies. These protocols describe which systems will be utilized for communications based on the type of information involved, the capabilities of the receiving parties, and the operability of all available systems.

Communications and Warning Systems Overview

Commercial Telephone

The primary means of voice communication between local EOCs, district facilities, private businesses, and other fixed sites during normal and emergency operations is through the public switch telephone network (PSTN). Telephone service to critical facilities often has diverse routing to separate switching centers. These systems can detect line failures and automatically re-route telephone calls via other telecommunications routes to ensure there is no loss of service. Commercial cellular telephone service is utilized as a secondary voice system, usually to support mobile communications.

During emergencies, emergency management, dispatch, and response organizations can utilize the Government Emergency Telecommunications

Service (GETS) to prioritize outgoing landline or cellular telephone calls or faxes over private and federal networks.

I-NET (Institutional Network)
I-NET is a fiber optic network designed to connect approximately 280 public facilities throughout the county. Owned, operated and maintained by King County government, the network provides data, voice, and video communications capabilities to various cities, schools, special purpose districts, and King County government facilities.

Facsimile
Facsimile through analog and cellular systems serves as a secondary data communications system during day-to-day and emergency operations. Broadcast facsimile capability is available through private vendors to rapidly disseminate hardcopy information to several pre-determined groups.

Alpha Text Paging
Alpha text paging is utilized as a primary system for communicating data and notifications to internal staff and regional partners.

Dial-In Conferencing
Conference call capability, maintained by various regional partners and available through private telephone companies, enables inter-agency, inter-jurisdictional, or countywide coordination of disaster events via landline telephones.

Satellite Telephone and Radio
Various regional partners maintain satellite telephone and radio terminals as secondary voice communications systems during emergencies. The telephone operation of these systems resembles a conventional cellular phone. For push-to-talk radio operation, users can communicate via two dedicated talk groups.

Internet / Email Communications
Email serves as a primary data communications system during day-to-day and emergency operations. All regional partners maintain email capabilities through which text and graphics can be widely disseminated in a minimal amount of time. Many regional partners maintain internet web sites for day-to-day posting of preparedness information. During emergencies and disasters, these web sites often serve as a secondary, yet critical, means of disseminating emergency response and recovery information (providing information directly to local media serves as primary).

Public Safety Answering Point (PSAP) Data Network
The 15 PSAPs in the county and the E-911 Program Office are linked through a dedicated data network. The network uses the county-wide microwave system with frame relay links for transport. This should ensure that the network will not be affected by public switched network congestion or other failures. The primary day-to-

day function of this network is to provide the PSAPs with a method of sharing data communications. In addition, the network is interfaced to the county-wide 800 MHz system, which allows the PSAPs to track and display real time radio activity. In the event of an area wide emergency, such as an earthquake, the data network has been designed to continue to function for communications among the PSAPs and the E-911 Program Office, even if the public switched network is unavailable.

PSAPs connected to PSAP Data Network:

Eastside Communications Center
Bothell Police Department
Enumclaw Police Department
Issaquah Police Department
King County Sheriff's Office
King County Fire District #13
Kirkland Police Department
Mercer Island Department of Public Safety
Washington State Patrol
Port of Seattle Police Department
Redmond Police Department
Seattle Fire Department
Seattle Police Department
University of Washington Police Department
Valley Communications Center

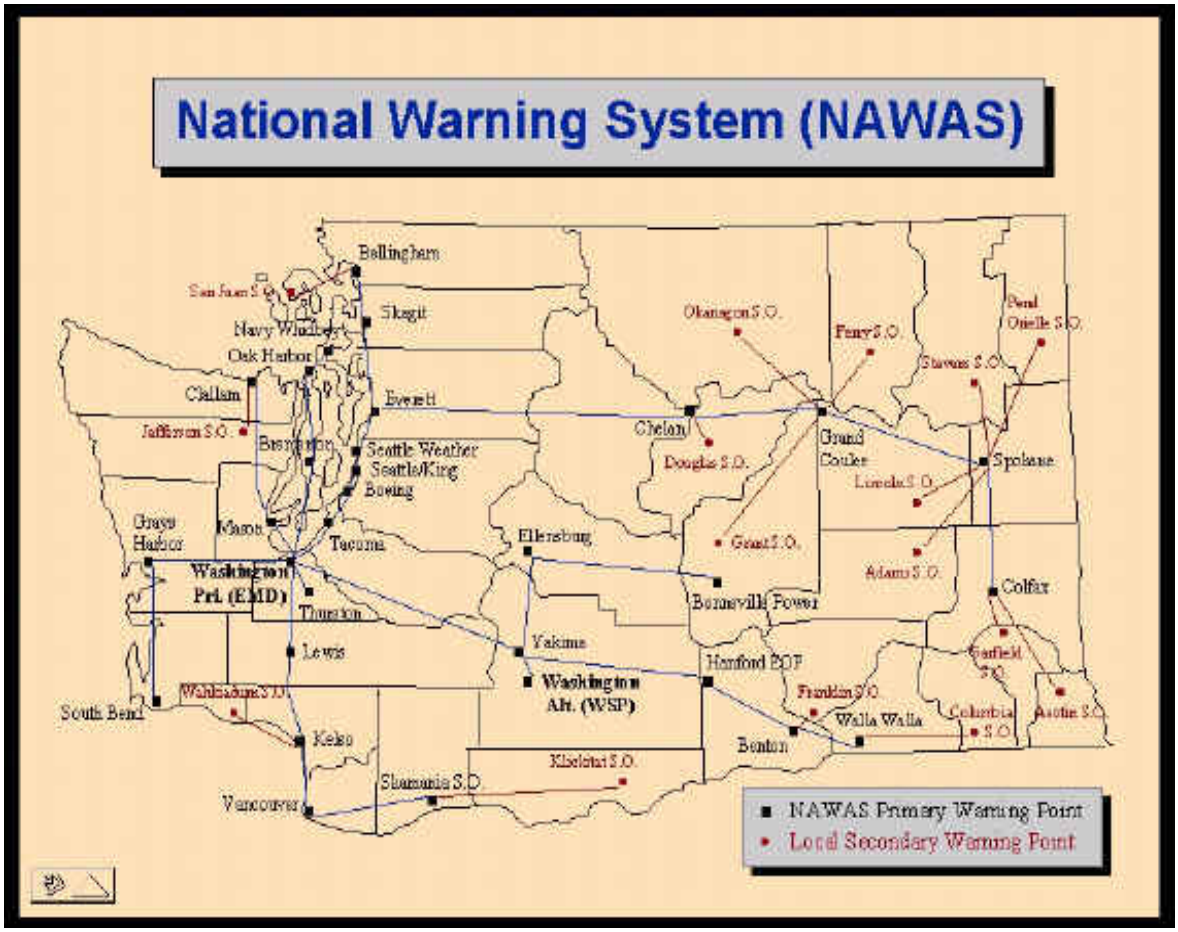
A Central Computerized Enforcement Service System (ACCESS)

ACCESS is a Washington State Patrol (WSP) owned and operated landline data system that supports all law enforcement agencies within the state. Through this system, law enforcement intelligence, criminal investigation data, and other essential law enforcement information is exchanged. For emergency management purposes, WSP has authorized and supports the use of ACCESS for dissemination of warning and notification information to local jurisdictions. Such information can include NWS warnings, watches and statements, and information regarding any threat to a jurisdiction. ACCESS is a secondary data notification system for law enforcement agencies and PSAPs. ACCESS terminals in King County are located in every PSAP, law enforcement department, and jail facility.

National Warning System (NAWAS)

The NAWAS system is a dedicated "open circuit" landline telephone system used to pass warning and notification information among federal agencies and state and local governments. In Washington, NAWAS is comprised of the Primary State Warning Point located in the state EOC, the Alternate State Warning Point located in the Washington State Patrol communications center, Yakima; and 29 local primary warning points.

NAWAS is a voice only network that allows simultaneous signaling and broadcasting to one or more warning points. Generally, warnings and other information are disseminated from the state primary or alternate warning point to all or selected local primary warning points. NAWAS is a primary system for dissemination of warning and other critical information from the State EOC to county EOCs and other NAWAS receiving sites in the state.



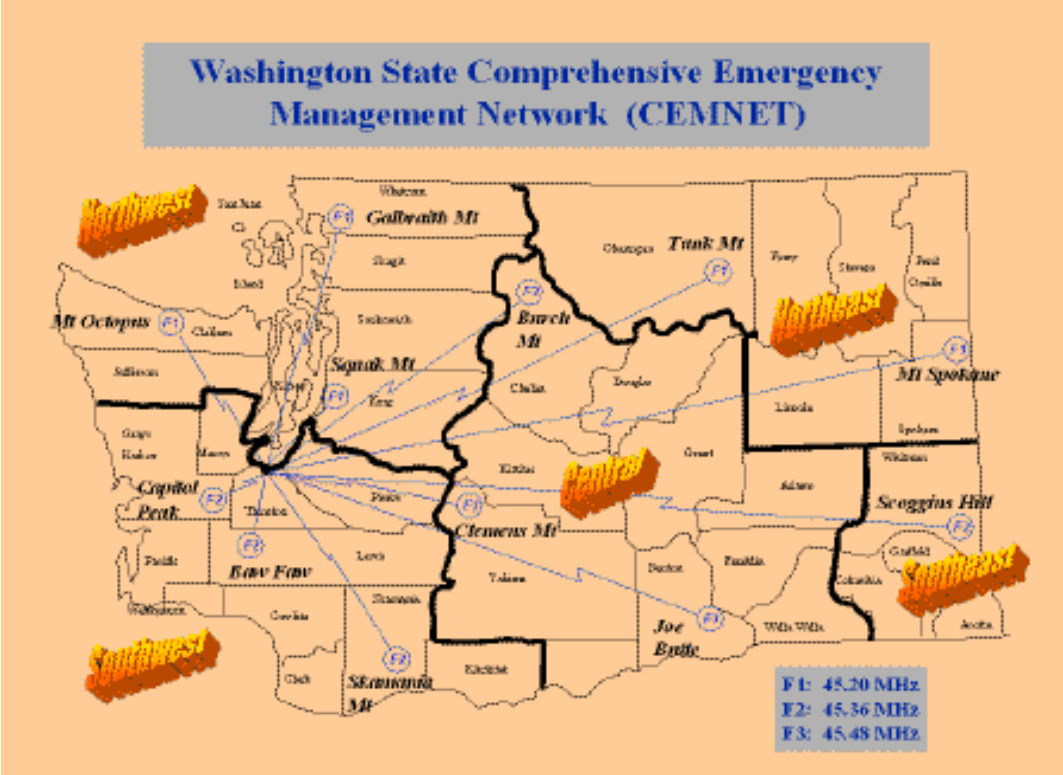
There are five NAWAS sites in King County: King County Sheriff's Office Communications Center (Primary Warning Point); King County EOC; City of Seattle EOC; Boeing Fire Department; NWS - Seattle office.

Radio Communications Systems

Regional partners maintain a wide range of radio communications capabilities across several established frequencies and systems including:

Comprehensive Emergency Management Network (CEMNET)

CEMNET is a very high frequency (VHF) low-band radio system operated by the Washington State Emergency Management Division. CEMNET serves as a secondary communication link between the state EOC and local EOC's throughout Washington. The following map depicts the location of the 12 mountaintop base stations that comprise the backbone of the network. The CEMNET base stations are controlled from the state EOC through the Washington State Patrol microwave system.



The following regional partners maintain CEMNET as a secondary communications system with the State EOC and with jurisdictions throughout the county and the Puget Sound Region:

- City of Seattle EOC
- City of Redmond EOC
- City of Snoqualmie EOC
- City of Bellevue EOC
- City of Mercer Island EOC
- City of Auburn EOC
- City of Kirkland EOC
- King County EOC
- Valley Communications PSAP
- University of Washington Seismology Lab
- NWS - Seattle
- Harborview Medical Center

CEMNET frequencies can be programmed into mobile radios to enhance intra-jurisdictional communications. During emergencies or periods of heavy radio traffic, the State EOC serves as Net Control for CEMNET.

800 MHz TRUNKED RADIO SYSTEM
The 800 MHz radio system serves as the primary day-to-day means of emergency voice communications between PSAPs, police and fire departments, emergency medical services, public school districts and public hospitals within King County. The system is also utilized day-to-day and during emergencies by several other county and city departments, special purpose districts, and hospitals. During emergencies, the system serves as a secondary voice communications system between the local EOCs.

The county-wide 800 MHz network is configured as three subsystems that work through common network controller equipment. Subsystems include the City of Seattle subsystem, the EPSCA subsystem (Bellevue, Kirkland, Mercer Island, Issaquah, Redmond), and the subsystem that was jointly developed by King County and Valley Communications Center. By connecting all sites within the subsystems to common network controller equipment, it is possible to implement talk groups on the system that have seamless coverage over the entire county. Using analog audio technology, the system has been designed for portable grade coverage wherever possible and the system loading is patterned so that all areas of the county experience relatively similar system capacity access.

Subregion	Number of Public Safety Customer Agencies	Number of Sites	Approximate Number of Radios Online 1/02
Seattle	2	7	4,500
EPSCA	19	6	2,500
King County/ Valley Com	47	13	5,500
Common Central Controller Sites	n/a	2	n/a
Total	68	28	12,500

Very High Frequency / Ultra High Frequency (VHF / UHF)
The King County ITS Division maintains several VHF and UHF repeater systems for public safety communications. These systems can be utilized, if needed, to support public safety communications throughout the county in addition to or in place of the 800 MHz system.

Amateur Radio

Several emergency management agencies in King County maintain amateur radio capability in their EOCs enabling voice communication over frequencies in the VHF and UHF bands and for a limited number of agencies, HF bands. During emergencies, amateur HF voice bands from 3.85 MHz to 29.7 MHz (80 meters - 10 meters) serve as a secondary communication system between the local EOCs and the State EOC. Amateur VHF voice bands from 52.05 to 54 MHz (6 Meters), 144.9 MHz to 148 MHz (2 meters) and the 440 Band (UHF) serve as secondary voice communications systems between local EOCs within the county and between EOCs and field staff or command posts.

A limited number of regional partners maintain packet radio stations, providing the capability to send and receive electronic data files via VHF packet radio equipment. During emergencies, packet radio serves as a secondary data communications link between regional partners.

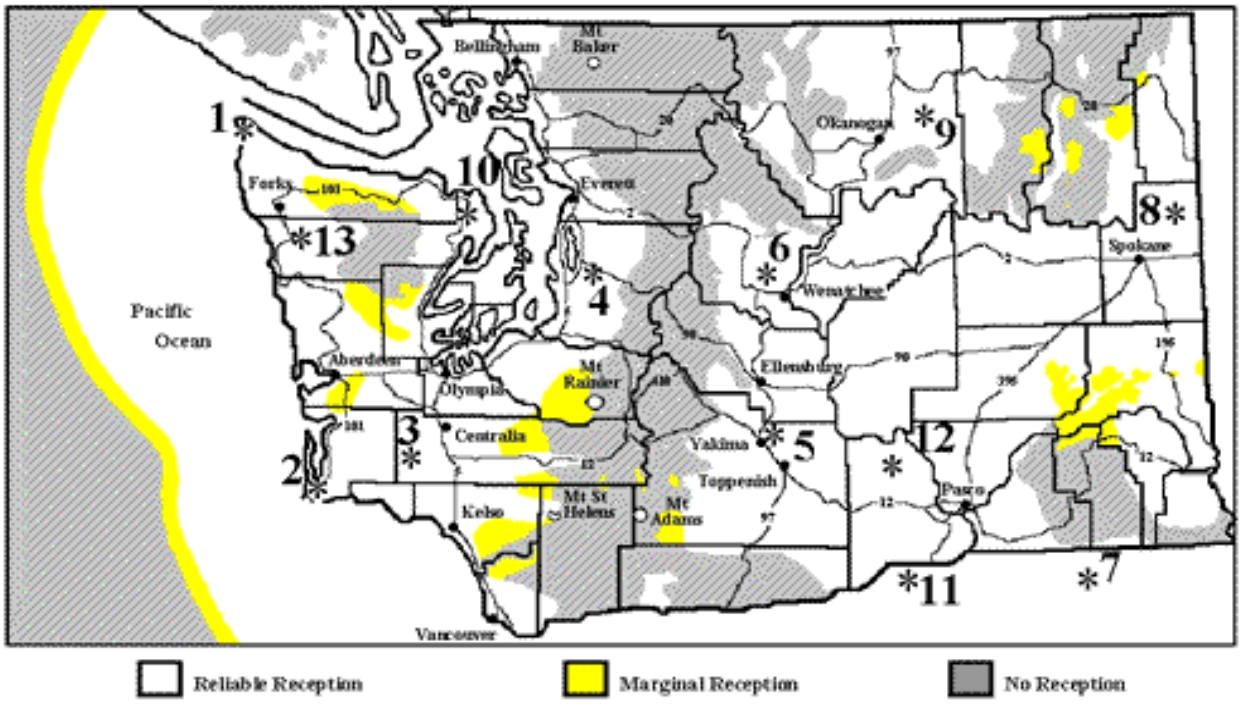
Amateur radio communications systems in local EOCs and field locations are operated most often by volunteers committed to supporting disaster response and recovery efforts. These volunteers are emergency workers registered with local emergency management organizations and trained to provide radio communications support during emergencies. Volunteer organizations such as the King County Search and Rescue Association and Amateur Radio Emergency Services support several local emergency management agencies with amateur radio resources. As emergency workers, amateur radio operators can be mobilized among regional partners as mutual aid assets.

Emergency Alert System

The Emergency Alert System is the primary means for regional partners to provide large areas of the county with immediate, critical information and warnings regarding emergencies and disasters. EAS replaced the Emergency Broadcast System as of January 1, 1998. EAS encoding devices are located in the KCSO Communications Center, Eastside Communications Center, King County EOC, Seattle EOC, and the National Weather Service - Seattle office. These devices enable the creation and transmission of verbal and text warning messages (limited to two minutes in length) throughout the Puget Sound Region. Messages are received by radio, television, and cable television stations, processed using EAS decoding devices and rebroadcast over television and radio networks. Media stations are required to maintain EAS equipment and rebroadcast national level warning messages. However, EAS warning messages issued by local and state agencies are voluntarily rebroadcast by media stations – there are no legal requirements for stations to rebroadcast local or state warnings.

NWS Weather Radio Network

The NWS Weather Radio Network is comprised of several VHF transmitters located throughout the state. The NWS forecast offices in Seattle, Spokane, and Oregon (Portland and Pendleton) broadcast current weather information, statements, watches, warnings, and advisories on a 24-hour basis. Commercially available weather radio receivers are located in EOCs, many public buildings throughout the county, and in many homes. For warnings, watches, or any severe weather situations, the Weather Radio Network transmits an alert tone to weather radio receivers within the area at risk and immediately follows with a voice message pertaining to the specific hazard. The NWS Weather Radio Network is also linked to the Emergency Alert System to rebroadcast all emergency management EAS warnings over weather radios. Transmitters listed below in bold service King County.



1 – Neah Bay..... 162.55 MHz
2 - Astoria OR..... 162.40 MHz
3 - Olympia (NWS Seattle) 162.475 MHz
4 - Seattle (NWS Seattle) 162.55 MHz
5 - Yakima (NWS Spokane) 162.55 MHz
6 - Wenatchee (NWS Spokane) 162.475 MHz
7 - Pendleton OR.... 162.55 MHz
8 - Spokane..... 162.40 MHz
9 - Okanogan..... 162.40 MHz
10 - Puget Sound (NWS Seattle) 162.425 MHz
11 - Umatilla..... 162.425 MHz
12 - Tri-Cities..... 162.45 MHz
13 - Mt Octopus..... 162.42 MHz

Emergency Management Weather Information Network (EMWIN)
EMWIN is a wireless broadcast service developed by the National Weather Service to provide a low-cost means of transferring weather and emergency data from a central point to an unlimited number of interested parties in range of the data signals. EMWIN was developed as a tool for emergency managers for obtaining essential real time weather information that is needed particularly during any emergency or disaster situation. Through a satellite down link and the use of specific software, users can receive real-time weather text data, images and animated graphics on their computers. It also enables the user to activate external devices such as pagers or alarms for special events as they are received.

Regional Communications Protocols

The following protocols define primary and secondary voice and data communications systems used by regional partners during normal and emergency operations. Systems are prioritized based on type of information communicated, the sending and receiving parties involved, and the functionality of primary systems.

Normal Operations	
VOICE	DATA
Primary Landline telephone for voice communications to and from daily work sites	**Primary** 1. Email for electronic communication of files, graphics, and messages to and from daily work sites 2. Web site postings of preparedness and contact information
Secondary Cellular telephone for communications to and from field locations	**Secondary** 1. Alpha Text Pager for brief data communications to specific personnel 2. Facsimile for all hardcopy data that can not be transmitted via email. 3. PSAP Data Network for exchanging ASCII data between PSAPs and the King County E-911 Program Office.

Emergency Operations	
VOICE	DATA
Primary 1. Landline telephone for voice communications between regional partners *[Note: Can be supplemented by use of GETS cards for increased reliability]* 2. NAWAS as the primary warning system between the Primary County Warning Point and the State EOC 3. 800 MHz radio network for voice communications between PSAPs	**Primary** 1. Email for electronic communication of files, graphics, and other information between specific users or defined groups 2. Web site postings for data files available to the public or restricted groups 3. Alpha Text Pager for brief data communications to specific personnel
Secondary 1. Cellular telephone when landlines are unusable; also for communications to and from field personnel 2. 800 MHz radio for communicating between EOCs, districts, field personnel and other regional partners with this capability 3. VHF / UHF government frequencies for in-county public safety communications when 800 MHz is overloaded or inoperable 4. Amateur Radio (6 meters VHF) for communicating between EOCs, districts, and other regional partners with 6 meters capabilities 5. Amateur Radio (2 meters VHF) for communicating between districts, hospitals, field sites and other regional partners with 2 meters capabilities 6. Amateur Radio (440 Band UHF) for communicating between hospitals and other regional partners with 440 band capabilities 7. CEMNET for communicating with the state EOC and other zone users	**Secondary** 1. Facsimile for all hardcopy data that can not be transmitted via email or web posting 2. PSAP Data Network for exchanging ASCII data between PSAPs and the King County E-911 Program Office. 3. Amateur Radio (Packet) for exchanging ASCII data files between the EOCs and other regional partners with packet radio capabilities.

Continue "Emergency Operations" – Secondary Voice… 8. Satellite Telephone for communicating with any telephone user when landlines and cellular telephones are inoperable 9. UHF Transit for communicating with the King County Transit EOC 10. Established VHF and UHF frequencies for monitoring marine radio traffic, airport radio traffic, and communicating with Puget Sound Energy when landline and cellular systems are unusable.	

Warning Communications	
Available systems for receiving warnings in local EOCs, PSAPs, and daily work locations *(not all systems available at all locations)*	Systems for transmitting regional warnings from local EOCs, PSAPs, and command posts *(not all systems available at all locations)*
1. NWS All Hazard Radio (receives NWS and EAS warnings) 2. NAWAS 3. Local TV; AM/FM Radio (receives EAS warnings) 4. Internet 5. EMWIN (receives NWS and EAS warnings) 6. ACCESS 7. 800 MHz Radio (Voice, PSAP Data Network)	1. EAS (disseminates warnings over Local TV, AM/FM radio and NWS All Hazard Radios) 2. 800 MHz Radio (Voice, PSAP Data Network) 3. Local media broadcasts 4. Internet

Radio Communications Protocols
Emergency Operations

1. Regional Disaster Plan participants with 800 MHz capability will coordinate intra-zone radio traffic based on local communications protocols.

2. The King County EOC will assist county departments, other jurisdictions and field personnel with coordinating inter-zone emergency management radio traffic on amateur frequencies and 800 MHz. Users will hail each other on a common frequency (KC EOC COM, 145.11MHz, etc.) and the King County EOC, serving as soft net control, will assist as needed with locating and directing users to an available frequency (KC EOC OPS, 147.22 MHz, etc.).

3. All Regional Disaster Plan participants with 800 MHz capability should monitor the KC EOC COM talk group (and other talk groups as they deem necessary) during emergencies. The King County EOC will also monitor the KC EOC OPS talk group.

4. Amateur radio frequencies will be utilized by Regional Disaster Plan participants for coordinating logistical issues with other EOCs and maintaining contact with field responders and emergency shelters. Amateur radio will also serve as an alternate radio communications system from EOCs when the 800 MHz system becomes overloaded or inoperable. The King County EOC will monitor and transmit over the King County Search and Rescue repeater (145.11) as a hailing frequency. Other available frequencies will be utilized for working discussions.

5. Public Health Seattle & King County serves as net control for the DHP COM 800 MHz talk group. Harborview Hospital serves as net control for the Hospital COM 800 MHz talk group.

6. During emergency operations, Regional Disaster Plan participants should monitor voice and data communications systems, particularly radio systems, in the order identified in this procedure, and as staffing resources are available (primary systems first, then secondary (800 MHz – VHF/UHF - 6 meter amateur - 2 meter amateur - 440 MHz amateur - CEMNET - 10 meter / 80 meter amateur, Satellite Radio))

Radio Talk Groups and Frequencies for Regional Communications

800 MHz Radio Talk Groups
KC EOC COM - Used by local emergency management agencies, districts, and county departments for hailing other users.

KC EOC OPS **-** Used for coordinating life and safety issues such as evacuations.

ALLGOV - Used as an alternate talk group for coordinating life and safety issues such as evacuations.

EM ZONE 1-5 **-** Reserved for each zone to use for intra-zone net control purposes. EM Zone 5 is used for hailing the Seattle EOC. The County and city EOCs can use these talk groups to hail EOCs within each respective zone.

LOC GOV N - May be used for coordinating operational issues between jurisdictions in EM Zone 1 (generally north of I-90 including the City of Seattle).

LOC GOV S - May be used for coordinating operational issues between jurisdictions in EM Zone 3 (generally south of I-90 including the City of Seattle).

Amateur Radio Frequencies and Capabilities
80 METERS: 3.987 MHz - Local EOCs with HF capability may monitor the State EOC HF frequency based on available staff and availability of primary systems.

6 METERS: 52.05-54.0 MHz - Frequencies are accessible in a limited number of local EOCs throughout the county. 6 METERS will be utilized by local EOCs as a secondary system to 800 MHz for coordination between emergency management zones and the King County EOC.

VHF - 145.11 MHz - King County Search and Rescue repeater frequency monitored and utilized for hailing between local EOCs; also used for communicating with field responders.

VHF and UHF Government Frequencies
Various frequencies are maintained and utilized by public safety agencies as an alternate communications system to the 800 MHz network

CEMNET

Operates primarily on three frequencies (channels): F1 – 45.200 MHz; F2 – 45.360 MHz; F3 – 45.480 MHz. For operational purposes, the state has been divided into five regions with a channel designated for use within each region. CEMNET sites within and around King County as well as their operating channels are listed below.

Base Station	Site Location	Call Sign
Capital Peak F2	King	KAQ680
Capital Peak F2	Pierce	KDL939
Capital Peak F2	Kirkland	KOM575
Capital Peak F1	SW Snohomish	SW Snohomish
Capital Peak F1	NWS - Seattle	Seattle Weather
Capital Peak F1	Harborview	Harborview
Capital Peak F1	UW - Seismology	UW - Seismology
Capital Peak F1	Seattle	Seattle
Capital Peak F1	Redmond	Redmond
Capital Peak F1	Snoqualmie	Snoqualmie
Squak Mt. F1	Valley Com	KOM586
Squak Mt. F1	Bellevue	WNRI590
Squak Mt. F1	Mercer Island	Mercer Island
Squak Mt. F1	Auburn	Auburn
Squak Mt. F1	Kitsap	KOM579

EMERGENCY SUPPORT FUNCTION (ESF) 2
TELECOMMUNICATIONS AND WARNING

APPENDIX 2 – Statewide Warning Fan-out